CALL FOR PROPOSALS

Process Science Initiative Program

Materials Preparation Center
Ames Laboratory

1. Introduction

Proposals are being solicited under a Process Science Initiative (PSI) program through the Materials Preparation Center (MPC) at the Ames Laboratory, a Department of Energy (DOE), Basic Energy Sciences User Facility. The PSI program is intended to provide researchers at national laboratories, universities and industry with access to facilities and resources, lacking at their home institution, that are needed to implement fundamental or "proof of concept" materials processing projects or to synthesize novel materials which are not commercially available. Proposed projects can entail a number of the following criteria: development of fundamental materials processing knowledge, materials process models, or the preparation of "high-risk" novel materials (*i.e*., projects with a relatively low probability of initial success, coupled with a relatively high potential "pay-off"). The emphasis is the development of the fundamental science in the processing of materials and/or gaining an understanding of the synthesis of novel materials. The research results obtained from a PSI sponsored project must be non-proprietary and are expected to be made available in the public domain through scientific publication(s).

The PSI program is open to both DOE and non-DOE Laboratory researchers to conduct materials processing research or the synthesis of novel materials using the wide variety of unique research facilities at the Ames Laboratory. Proposed projects typically extend for a 6 to 12 month performance period. Proposals for continuation of an existing PSI project should use the same request form.

As a DOE User Facility, the Ames Laboratory MPC's unique materials synthesis and processing equipment, tools, supplies and facilities, and its expert personnel, are available to assist national laboratory, university, corporate and other researchers (researchers both inside and outside of the Ames Laboratory's DOE programs). A comprehensive list of MPC equipment and facilities is available on the World Wide Web at http://www.mpc.ameslab.gov/. Those contemplating submissions are encouraged to contact the PSI Program Manager to discuss appropriateness of their proposal before final submission. Successful proposals will utilize the extensive processing capabilities of the MPC and the staff of the Ames Laboratory. One year duration projects will commence on or about the fiscal year beginning October 1, 2002. The **due date** for these proposals is **September 3, 2002**. Shorter duration proposals, requiring 6 months or less to complete, can be submitted at any time. However, proposals requiring 6 months or less will be evaluated as they are received so those submitted late in the fiscal year may not be considered for funding this fiscal year if funds are not available.

2. Motivation for the PSI Program

There has been an increasing demand expressed during recent years for basic materials processing science. Specifically, the synthesis of new or improved materials may require new processes, modification or optimization of current practices, or modification of existing equipment. The MPC has been approached by a significant number of DOE Laboratory, Ames Laboratory, university and company researchers who recognize both the need for new scientific knowledge about materials processing, and the many unique capabilities that the MPC has acquired from over 50 years of successful Ames Laboratory research within the DOE materials science community, capabilities which have allowed it to contribute to advances in the materials processing sciences. Indeed, there are very few alternative centers in the United States or the world that researchers can turn to for similar materials processing research capabilities.

The purpose of the PSI program is to provide access to facilities and expertise beyond a researcher's current capabilities to pursue either basic research in the synthesis of novel materials or the development of a promising new processing technique. In other words, the PSI provides means to address materials processing problems for which resources at the proposer's institution not available. Researchers in Condensed Matter Physics, Materials Science and Physical Chemistry are encouraged to submit proposals utilizing MPC unique capabilities and facilities. High quality materials and characterization tools may also be covered as part of a research project.

3. PSI Program Format

While there exist many opportunities for the MPC to aid in the initiation of, or in the progress of, research projects that advance materials processing techniques and/or require the synthesis of novel materials, the proposed project must fall within the capabilities of the existing MPC/Ames Laboratory facilities. An Ames Laboratory researcher will assist as a collaborating PI (see http://www.external.ameslab.gov/Research/index.html). The latter is deemed necessary in order to ensure compliance with safety regulations and standard operating procedures and to promote timely progress for the project. Proposals that describe projects outside of the MPC's capabilities will be dropped from further consideration. A further stipulation is that the research results which stem from a proposer's involvement in the PSI program must be non-proprietary in nature and, moreover, must be made available in the public domain in the form of scientific publication(s), preferably peer-reviewed. Published results, in whole or part supported by the PSI program, must also acknowledge this support in an appropriate manner. Copies of PSI supported publications must be sent to the PSI program manager.

The success of proposals will depend on peer-reviewed scientific merit, suitability of MPC facilities for the proposed project, recruitment of an Ames Laboratory collaborator (which can be facilitated by the PSI Program Manager, if needed), and the appropriateness of the project to fundamental Basic Energy Science (BES) objectives (see http://www.er.doe.gov/production/bes).

Proposers are encouraged to demonstrate viability of the project through demonstration of current funding or matching or resources. Typical types of partnering

effort could include: the provision of starting materials, the utilization of specialized equipment or instrumentation, or materials characterization at other DOE User Facilities. Such support would be considered in the proposal evaluation process after the criteria for scientific merit and technical approach. It is stressed that the goal of the PSI program is the development of basic knowledge in the materials processing sciences, and that the results of this are meant to be non-proprietary in nature. Additional outside research partners, in particular industrial partners should be thoroughly apprised of the "basic" and "non-proprietary" nature of the program before they contribute funding or other resources to the project, and any research partners will be required to execute a standard PSI/MPC user agreement with the MPC before the commencement of any work. The agreement stipulates the terms and conditions for the interaction (including the requirement to publish the results). The basic structure of the agreement is provided at the end of this document.

Undergraduate and graduate students will be utilized to perform work, whenever possible, to provide the maximum educational and training benefit for each project. Proposers and guest researchers will be permitted to participate in on-site experimental activities for additional educational and technology transfer benefit, if safety considerations and work schedules permit and the requirements of the Ames Laboratory Visitor program are met. Travel expenses for visiting researchers and students will be considered. Note, however, that the PSI program will not provide salary support for visiting researchers or students.

Researchers will be required to submit a final report at the completion of their PSI-sponsored project.

4. PSI Proposal Content

The PSI proposal should be no longer than 3 typed pages (not including cover page given at the end of this document and one-page resumes of the Principal Investigators). Both the proposing and the collaborating Ames Lab/MPC PIs should be clearly identified. A page is defined as 8.5 x 11-inch paper, typed on one side, with at least one-inch margins, and a proportional typeface of 10-, preferably 12-point. Proposals are **due September 3, 2002**, and should address the following items:

1. SCIENTIFIC AND/OR TECHNICAL BACKGROUND. Explain the importance of the scientific question(s) or technological problem(s). Identify the areas in which the proposal demonstrates innovation or uniqueness, advancing the development of fundamental materials processing knowledge, materials process models, and the preparation of "high-risk" novel materials. Identify areas of the proposal that have already been explored, and the way the proposal complements or advances these efforts.

   In the case of a proposal submitted by a DOE researcher (*i.e.*, an "internal" proposal), it is important to explain how this work differs from currently funded projects and why available resources are not appropriate.

2. PROPOSED METHOD(S) OR TECHNICAL APPROACH(ES). State the technical objectives and the desired results stemming from the proposed PSI project. Discuss the plan-of-work that will allow the project to achieve its desired objectives, with emphasis on how the technical approach and analyses will address the questions or problems identified in the preceding 'Scientific Background'. In addition, state the probability of important results or new understanding that may emerge from this work, and project the relationship between this project and future R&D efforts. Identify specify specific methods and materials as much as possible.

3. MPC RESOURCES REQUESTED. Describe the facilities, equipment, tools, supplies and staff capabilities required and expected time commitments for methods within the proposed work plan. The number of experimental iterations, variations of compositions, processing times etc. should be explicitly stated. The use of state-of-the-art analysis methods, simulation and modeling, and computer techniques is encouraged but not a requirement. Proposers are encouraged to contact the MPC and its Director in order to identify both Ames Laboratory collaborators and MPC capabilities.

5. Proposal Submission

The original and four copies of the proposal are due into the MPC office by 5:00 pm on **September 3, 2002**.

PSI Program
Materials Preparation Center
Ames Laboratory
121 Metals Development Building
Ames, IA 50011-3020

Subject to seeing the actual number of proposals submitted in response to this PSI call, PSI program staff currently expect that proposal reviews will be completed within ten (10) working days after the closing date. Should there be any need for an extension, PSI staff will contact those who have submitted proposals to inform them of the expected decision-date. Those who write successful proposals will be notified directly by PSI program staff, and the list of awardees will be posted on the MPC web site. Others may request an informal de-briefing from PSI staff.

6. Further Information

The MPC (phone (515) 294-5236) will be the contact point for general information regarding the PSI program. Specific questions pertaining to the PSI program should be directed to Matthew J. Kramer, PSI Program Manager, phone (515) 294-0276, FAX (515) 294-4291, or email mjkramer@ameslab.gov.

AMES LABORATORY

No.: _____ **Date:** _____

Process Science Initiative Request

(To be completed by the Proposer)

Institution Name:_____

Institution Contact (Name)_____

Address:_____ City, State, Zip:_____

Telephone No.:_____ Fax No._____ E-Mail:_____

Project Title:_____

_____

Ames Laboratory Coordinating PI: _____

PROVIDE SUFFICIENT SCIENTIFIC DETAIL, UNDER EACH OF THE FOLLOWING HEADINGS, TO ENABLE AMES LABORATORY REVIEWERS TO DETERMINE THE APPROPRIATENESS FOR ASSISTANCE. PSI proposals should be no longer than 3 typed pages (not including the cover page, the following Materials and ServicesRequested page and one-page resumes of the Principal Investigators).

SCIENTIFIC AND/OR TECHNICAL BACKGROUND: *(limit 1500 words)*

PROPOSED METHOD(S) OR TECHNICAL APPROACH(ES): *(limit 1000 words)*

MPC RESOURCES REQUESTED: (*limit 500 words)*
(Include specifics if appropriate, i.e., range of compositions to synthesize, number of iterations of a processing technique varying temperature, etc. as appropriate). Filling in the following table should assist in defining the individual tasks.

AMES LABORATORY

No.: _____ **Date:** _____

Facilities and Materials Requested

Indicate materials, characterization and processing equipment anticipated. Where appropriate, indicate processing parameters and approximate number of samples to be processed or characterized. This section is not meant to be exhaustive but to provide a general scope of the work; details should be in the preceding section. Full detailed listing of facilities and their capabilities are found on the WEB at http://www.mpc.ameslab.gov/.

Materials Processing	**Please indicate if needed**	
Arc melting		
Vacuum Induction Melting		
Rapid Solidification		
Melt spinning		
Gas Atomization		
Powder classification		
Plasma arc melting		
Single crystal growth		
Mechanical alloying		
Thermal spray (plasma arc or HVOF)		
Furnaces	**Max Temperature**	**Atmosphere**
(specify if known)		
Primary Cold Fabrication Facilities		
Extrusion (isostatic or conventional)		
Rolling		
Swaging/Drawing		
Materials Needs	**Type**	**Mass**
Precious metals		
Rare Earth metals		
Other (specify purity)		
Mechanical/Thermal Processing	**Pressure**	**Temperature**
Hot rolling		
Hot extrusion (isostatic available)		
Hot isostatic pressing (HIP)		
Cold isostatic pressing (CIP)		
Materials Characterization	**Approximate # of samples**	
Chemical Analysis		
Inductively coupled plasma spectroscopy		
Carbon/Sulfur		
Oxygen/Nitrogen		
Hydrogen		
Thermal analysis (indicate atmosphere and temperatures)		
DTA		
DSC		
TGA		
Magnetic properties		
Optical Microscopy		
Scanning Auger Microscopy		
Scanning Electron Microscopy		
Energy Dispersive Spectroscopy		
Transmission Electron Microscopy		
Energy Dispersive Spectroscopy		
Energy Loss Spectroscopy		
Tribological measurements		
XPS		
X-ray Diffraction		

AMES LABORATORY

No.: _____ Date: _____

Process Science Initiative Proposal Agreement

_____("Requester"), with a principal place of employment at:

_____

seeks processing science funding from the Ames Laboratory ("AL"), Materials Preparation Center ("MPC"), to perform a "Processing Science Project" as proposed in the attached "Process Science Initiative Request" document.

1. Requester represents that the proposed project is unique and original research that cannot be obtained in a reasonable manner from private facilities on an independent, convenient, or timely basis, based on a documentable search procedure performed by the requester. This search for alternative facilities can be facilitated by the MPC Director or the PSI Program Manager, if requested.

2. Requester shall report the results of the research performed under the PSI program in the scientific literature, preferably peer-reviewed, with appropriate acknowledgements to the DOE for funding under the PSI program and in a timely manner, but not to jeopardize patentability of any Subject Inventions conceived under this agreement. A summary final project report also must be submitted within one month from the conclusion of the project.

3. Employees of AL performing under this Agreement remain AL employees, and any invention(s) made by those employees are governed by provisions of AL's prime contract W-7405-ENG-82 with the U.S. Department of Energy ("DOE"). Each Party shall have the first option to retain title to any Subject Inventions solely made by its employees during the work under this Agreement. The Parties agree to disclose to each other each and every Subject Invention, which may be patentable or otherwise protectable under the Patent Act. The Parties acknowledge that the Requester and Ames Laboratory will disclose Subject Inventions to the DOE within two (2) months after the inventor first discloses the Subject Invention in writing to the person(s) responsible for patent matters of the disclosing Party. If a Party elects not to retain title to any such Subject Invention of its employees, then the other Party shall have the option of electing to retain title to such Subject Inventions under this Agreement.

   The Parties acknowledge that the DOE may obtain title to each Subject Invention reported under this Article for which a patent application is not filed, a patent application is not prosecuted to issuance, or any issued patent is not maintained by any Party to this Agreement. The Government shall retain a nonexclusive, nontransferable, irrevocable, paid-up license to practice, or to have practiced, for or on its behalf all Subject Inventions under this Agreement throughout the world. For Subject Inventions conceived or first actually reduced to practice under this Agreement which are joint Subject Inventions made by the Requester and Ames Laboratory, title to such Subject Inventions shall be jointly owned by the Requester and Ames Laboratory.

4. AL does not and will not have comprehensive knowledge of the uses that the Requester will make of the Process Science project results or experimental materials . Requester assumes all responsibility to conduct whatever survey, studies, test samplings, and other activities are needed to ensure the marketing and ultimate use of safe, efficient and reliable products and services.

5. In partial consideration of AL's assistance, the Requester agrees to hold harmless AL, ISU, DOE, and their respective employees from any liability or claim alleged to arise from the conduct of the project.

6. The parties expect that processing science studies can be provided without the Requester disclosing proprietary information. Should a need arise to exchange proprietary information, an appropriate nondisclosure agreement will be executed.

7. Neither AL, nor ISU, nor DOE, nor persons acting on their behalf are liable for any injury to or death of persons or other living things or damage to or destruction of property or for any other loss, damage, or injury of any kind whatsoever, including costs and expenses incurred resulting from discussions, meeting, visits, or any activities or interactions conducted by AL to provide processing science studies, advice or other services to the Requester under this Agreement to the extent such injury, death, damage, destruction or loss is not caused by the negligence or willful misconduct by AL, ISU, or DOE.

Process Science Initiative Proposal Agreement

8. **Neither AL, nor ISU, nor DOE, nor persons acting on their behalf make any warranty, express or implied: (a) with respect to the merchantability, accuracy, completeness, or usefulness of any services, materials, or information they furnish; (b) that the use of such services, materials or information may not infringe privately owned rights; or (c) that the services, materials, or information they furnish will be adequate or safe for any purpose or will accomplish the intended results or purpose. Furthermore, AL, ISU, and DOE specifically disclaim any and all warranties, express or implied, for any products manufactured, used or sold by Requester. Neither AL, nor ISU, nor DOE are liable for special, incidental or consequential damages in any event.**
9. Any modification in the terms of this Agreement is valid only if the modification is made in writing and executed by the parties to this Agreement.
10. Requester shall promptly comply with AL's reasonable requests for information such as reports, publications etc. as to the outcome of the Process Science Initiative Funding.
11. AL expects the investigator to complete the work plan of the proposal on a timely basis, but AL reserves the right to preempt or delay this work. AL or the Requester may also terminate this Agreement at any time, but paragraphs 3, 4, 6, 7, 9 and 11 survive any termination.
12. Requester must acquire AL's authorized written permission to use AL's name.

Company Official	Ames Laboratory
By _____ (Signature)	By _____ (Signature)
Name _____ (Please Print)	Name _____ (Please Print)
Title _____ (Please Print)	Title _____ (Please Print)